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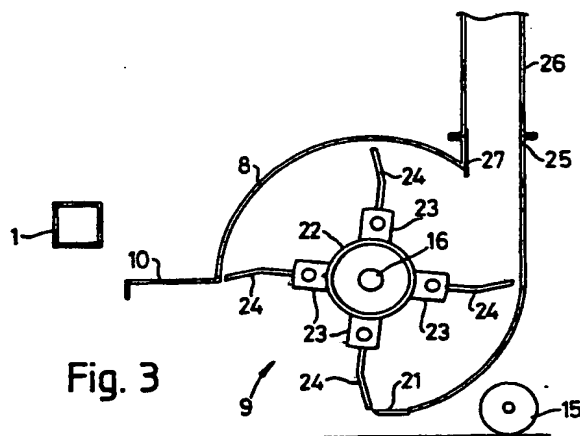
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(54) Forage harvester

(57) A forage harvester comprises a cylindrical housing (8) having a horizontal axis in use and being open at a lower quarter (9) thereof. A shaft (16) is journaled for rotation within the housing (8) and carries flails (24). The housing (8) is advanced in a direction from right to left in Fig. 3 so that grass enters the open lower quarter (9) of the housing (8) and the shaft (16) is rotated in an anticlockwise direction in Fig. 3 so that the flails (24) cooperate with a fixed cutting edge (21) at the bottom of the open quarter (9). A chute (26) extends upwards and tangentially from the housing (26) for passing cut grass from the housing.



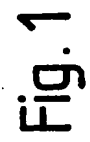
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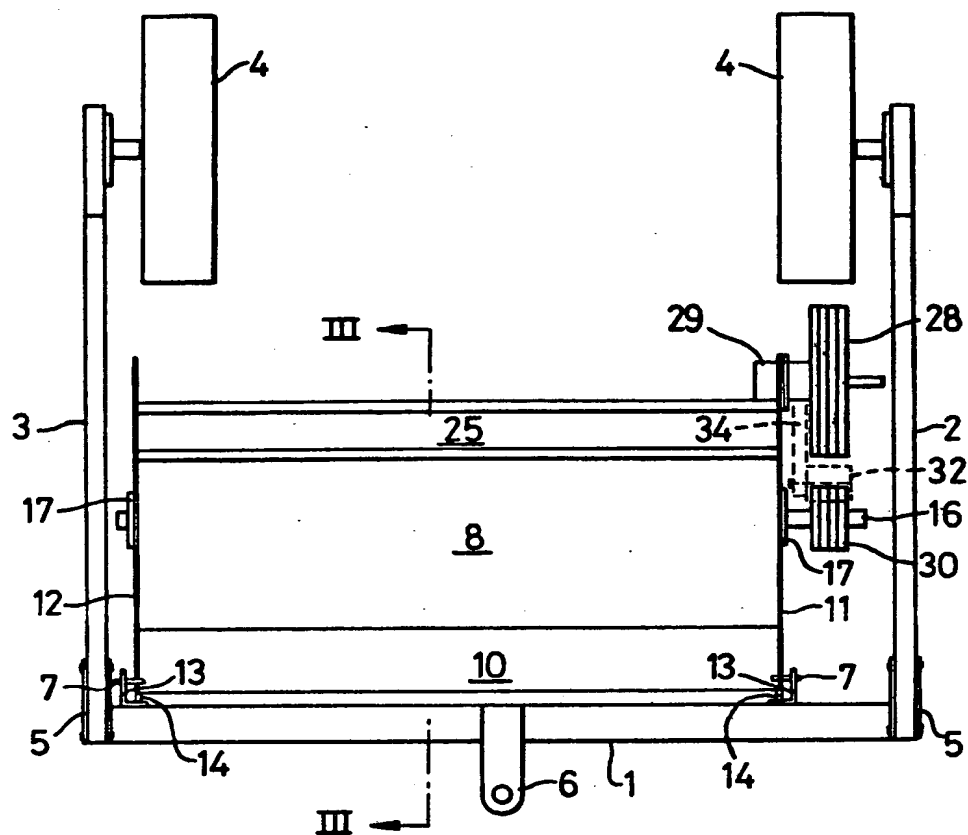


Fig. 2

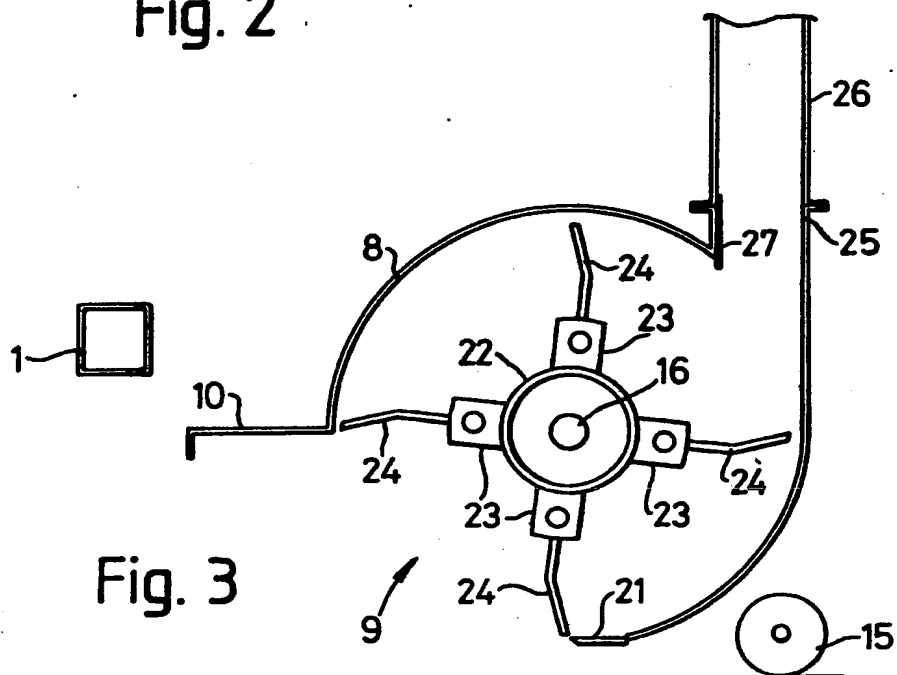


Fig. 3

Forage Harvester

Description

This invention relates to forage harvesters.

5 In conventional double chop forage harvesters, a cylindrical housing has a horizontal axis and is open in one lower quarter thereof. Within the housing there is a shaft carrying flails. In use, the housing is advanced in such a direction transversely to its axis that grass enters the open lower quarter. Further-
10 more, the shaft is rotated in such a direction that the flails pass through the open quarter of the housing in the direction of advance of the housing. By this means the flails strike the grass near the base thereof and throw long lengths of cut grass into a worm assembly
15 which conveys the grass to a chopping box, in order that the required short lengths are delivered to the trailer from a chute attached to the chopping box.

20 There are two main disadvantages in such forage harvesters. Firstly, due to the battering of the grass by the flails there is a delay in the recovery of the stubble and in further growth. Secondly, the chopping box is susceptible to damage by foreign bodies.

An object of the invention is to obviate or mitigate the above disadvantages.

25 According to the invention there is provided a forage harvester comprising a cylindrical housing having a horizontal axis in use and open at a lower quarter thereof, a shaft journaled for rotation within the housing and carrying flails, the housing being
30 intended to be advanced in such a direction transversely to its axis that grass enters the open lower quarter of the housing and the shaft being intended to be rotated in such a direction that the flails pass through the open quarter in the direction opposite to the direc-
35 tion of advance of the housing and co-operate with

a fixed cutting edge at the bottom of the open quarter and a chute extending upwards and tangentially from the housing for passing cut grass from the housing.

5 Unlike the conventional forage harvester the grass is cut starting from the top as the grass first enters the open quarter of the housing and is finally cut against the cutting edge. This results in the stubble being more cleanly cut so reducing the delay in its recovery and in further growth. Furthermore,
10 there is no need for an additional chopping box.

An embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:-

Fig. 1 is a side elevation of a trailed forage
15 harvester according to the invention;

Fig. 2 is a plan view of the harvester in Fig. 1; and

Fig. 3 is a section on line III-III in Fig. 2.

20 In the drawings a trailed forage harvester comprises a wheeled trailer in the form of a frame comprising a cross member 1 and two side trailing arms 2 and 3 supported by ground-engaging-wheels 4. The arms 2 and 3 are secured to the cross-member 1 at 5 and a tow-bar 6 is secured centrally to the cross-member
25 1.

The trailer pivotally supports at 7 an assembly comprising a cylindrical housing 8 having a horizontal axis and open at the leading lower quarter 9. A lip
30 10 extends forwards from the upper edge of the quarter 9. The housing 8 is closed at its ends by central portions of respective generally rectangular plates 11 and 12 having pivot pins 7 extending through the upper front corners of the plates 11 and 12. The pins 7 also extend through angle brackets 13 secured to
35 the cross-member 1. The brackets 13 also carry stop

screws 14 for adjusting one limit of the pivotal movement of the assembly relative to the trailer frame. The assembly is supported by a ground-engaging roller 15 supported between the plates 11 and 12 near the lower rear corners thereof. The roller 15 is height-adjustable relative to the plates 11 and 12 but the means for effecting this adjustment is not illustrated.

A shaft 16 is journaled for rotation in bearings 17 fixed to height-adjustable slotted plates 17' bolted to the plates 11 and 12 and bridging openings 18 in the plates. The openings 18 serve to accommodate the height adjustment of the shaft 16 and provide air inlets into the housing 8. Brackets 19 are fixed to the plates 11 and 12 and carry adjusting screws 20 which move the slotted plates 17' in a vertical direction thus giving height adjustment of the shaft 16 relative to the plates 11 and 12 and a fixed shear bar 21. The shear bar 21 has a cutting edge and is supported between the plates by bolts which also secure the brackets 19.

A drum 22 is mounted fast on the shaft 16. Lugs 23 project radially from the drum 22 and flails are mounted thereon. The flails are each in the form of steel strips 24 about $3\frac{1}{2}$ inches wide and bent towards the cutting edge of the shear bar 21 and also provided with a cutting edge. The flails 24 have their widths extending parallel with the axis of the drum 22 and the shaft 16. Extending tangentially and upwardly from the rear of the housing 8 is a flanged outlet 25 to which a chute 26 is attached leading to a swan neck terminal outlet (not shown). An air shear plate 27 mounted with vertical adjustment in the outlet 25 increases the volume of air forced up the chute 26. The flails 24 pass the cutting edge of this plate 27 with minimal clearance.

The shaft 16 is driven via a drive pulley 28 journaled in a bearing housing 29 mounted on an extension of the side plate 11 at its upper rear corner. A driven pulley 30 is fast on the shaft 16 and an endless belt 31 is trained about both the pulleys 28 and 30. A jockey pulley 32 is journaled on one end of an arm 33 pivoted at its other end at 34 to the side plate 11. A link 35 has one end articulated to the arm 33 between the pulley 32 and the pivot 34. The other end of the link 35 is screw-threaded and extends through a hole in a bracket 36 secured to the plate 11. Nuts on the screw-threaded end of the link 35 enable slack to be taken up on the slack side of the belt 31.

In use the forage harvester described and illustrated is pulled beside a tractor rear wheel and the pulley 28 is driven by the tractor power take-off via a right-angle gearbox and connecting drive shafts. A collecting trailer is towed behind the tractor by a frame fixed to the tractor, the frame also supporting the right-angle gearbox. Adjustments may be carried out as desired at the stop screws 14, the roller 15, the slotted plates 17', the air shear plate 27 and the link 35, the main considerations being that the flails 24 cannot strike the cylindrical wall of the housing 8 and pass the shear bar 21 and the shear plate 27 at a small clearance and that the shear bar 21 is clear of ground level. The shaft 16 and the flails 24 are rotated in an anticlockwise direction and the harvester is towed from right to left in Figs. 1 and 3. Thus, grass enters the lip 10 and into the open quarter 9 of the housing. In so doing the grass is cut starting from the top and is finally cut against the cutting edge of the shear bar 21 leaving a cleanly cut stubble. The grass is thus cut into short lengths which are thrown upwards into the chute 26 and ejected

forcefully from the swan neck into the collecting trailer. The motion of the flails 24 also produces a rush of air into the housing 8 through the openings 18 and upwardly through the chute. This rush of air greatly
5 increases the force with which the grass is ejected from the mouth of the swan neck giving increased accuracy of placement in the trailer especially in windy conditions.

Claims

1. A forage harvester comprising a cylindrical housing having a horizontal axis in use and open at a lower quarter thereof, a shaft journaled for rotation within the housing and carrying flails, the housing being intended to be advanced in such a direction transversely to its axis that grass enters the open lower quarter of the housing and the shaft being intended to be rotated in such a direction that the flails pass through the open quarter in the direction opposite to the direction of advance of the housing and co-operate with a fixed cutting edge at the bottom of the open quarter, and a chute extending upwards and tangentially from the housing for passing cut grass from the housing.
2. A forage harvester according to claim 1, comprising a wheeled trailer to which the cylindrical housing is hinged at its front end.
3. A forage harvester substantially as hereinafter described with reference to the accompanying drawings.

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